Remarks

Status of the Subject Application

Claims 3, 11, and 20 are objected to because of informalities. Claims 4, 11, and 15-20 stand rejected under 35 U.S.C. §112, first paragraph as failing to comply with the enablement requirement. Claims 5 and 18-20 stand rejected under 35 U.S.C. §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 15-20 stand rejected under 35 U.S.C. §102 as being anticipated by U.S. patent number 4,987,373 to Soo (hereinafter "Soo"). Claims 1-6, 9, and 11-14 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. patent number 4,763,207 to Podolak et al. (hereinafter "Podolak").

Claim Objections

Applicants have amended claim 3 such that the term "clock tunable" includes a hyphen, as required by the Examiner. Applicants submit that every use of the term "clock-tunable" in claim 11 already includes a hyphen (see Preliminary Amendment dated June 17, 2003). Applicants have also amended claim 20 to refer to the "self-tuning filter" as required by the Examiner. Applicants, accordingly, request that the Examiner withdraw those objections.

Claim Rejections Under The First Paragraph Of 35 USC § 112

The Examiner rejected claims 4 and 11, stating that they recite a phase-lock loop that is not shown in Figure 7 or described in the specification. Applicants submit that the phase-lock loop is described at various locations in the specification including in the detailed description at page 6, lines 20-22 and page 9, lines 17-20. Moreover, a frequency matching circuit 106 is shown in Figure 1 and it is known to those skilled in the art that a phase-lock loop may operate as a frequency matching circuit as is stated at page 6, lines 20-22 and page 9, lines 17-20. Accordingly, Applicants submit that use of the

phase-lock loop as a frequency matching circuit is enabled in the specification and request that the Examiner withdraw that rejection.

The Examiner rejected claim 15 as a single means claim, citing In re Hyatt, 708 F.2d 712, 714-715. In Hyatt, the court stated that "the final paragraph of § 112 sanctions the use of the means-plus-function format for combination claims only." *Id.* at 713. The court further stated that the claim in question in Hyatt was "a claim drafted in 'means-plus-function' format yet reciting only a single element instead of a combination." *Id.* at 714. The court concluded that the claim in question was properly rejected because it was a single means claim. *Id.* at 715.

MPEP § 2181(I) states "A claim limitation will be interpreted to invoke 35 U.S.C.112, sixth paragraph, if it meets the following 3-prong analysis:

    (A) the claim limitations must use the phrase "means for" or "step for;"
    (B) the "means for" or "step for" must be modified by functional language; and
    (C) the phrase "means for" or "step for" must not be modified by sufficient structure, material or acts for achieving the specified function.

Applicants submit that claim 15 is not a means-plus-function claim because it is not drafted in means-plus-function form and because claim 15 recites structure of the filter rather than function of the filter. Applicants therefore submit that the rejections under 35 USC § 112 second paragraph is improper and request that the Examiner withdraw that rejection.

Regarding the Examiner's statement that "in claim 1, the claimed subject matter of 'the input signal received a constant number of samples of samples [sic] previously in filter form' does not discuss [sic] in the specification since the input signal from the sensor is an analog signal," the quotation recited by the Examiner is not recited in claim 1 and the rejection of claim 1 under § 112 is, at least for that reason, not clear. Claim 15 recites something closer to the quotation recited by the Examiner, but the quote is not accurate with regard to claim 15 either. Applicants submit that analog signals are

sampled periodically at inputs of data acquisition units and those analog signals are converted to digital signals when sampled. Accordingly, Applicants traverse that rejection and request a clarification if the rejection is to be reinstated.

In response to the rejection of claim 17 presented by the Examiner, Applicants have amended claim 17 to recite the data acquisition device separate from the self-tuning filter.

Claim Rejections Under The Second Paragraph Of 35 USC § 112

The Examiner rejected claim 5 stating "'the data acquisition device' lacks antecedent basis" and "the claimed subject matter of claim 5 is already recited in claim 1." In claim 5, the "data acquisition device" was amended in the Preliminary Amendment filed June 17, 2003 to read "data acquisition unit," and refers to the data acquisition unit recited in the first line of claim 1. Moreover, claim 5 adds that the input coupled to the digital clocking signal in claim 1 is an input of the data acquisition unit, which is not recited in claim 1. Accordingly, Applicants traverse that rejection.

The Examiner rejected claim 18 stating the phrase "the number of samples" lacks antecedent basis. Applicants point out that the "number of samples" is recited in the last line of claim 15 from which claim 18 depends. Accordingly, Applicants traverse that rejection.

The Examiner rejected claim 19 stating the phrase "the ratio of sampling frequency to filter frequency" lacks antecedent basis. Regarding antecedent basis, MPEP § 2173.05(e) states, "[o]bviously, however, the failure to provide explicit antecedent basis for terms does not always render a claim indefinite. If the scope of a claim would be reasonably ascertainable by those skilled in the art, then the claim is not indefinite." MPEP § 2173.05(e) also states, "Inherent components of elements recited have antecedent basis in the recitation of the components themselves." Applicants submit that a sampling frequency and a filter frequency are inherent in the apparatus of claim 15 from which claim 19 depends and that a ratio between two such

values is also inherent. Applicants have, however, amended claim 19 to clarify those terms. Accordingly, Applicants request that the Examiner withdraw that rejection.

The Examiner rejected claim 20 stating the phrase "the signal" lacks antecedent basis. Applicants have accordingly amended claim 20 to recite "the input signal," which is recited in claim 15. Accordingly, Applicants request that the Examiner withdraw that rejection.

Claim Rejections Under 35 U.S.C. § 102

The Examiner rejected claims 15-20 as being anticipated by Soo. Applicants note that the Examiner states "Soo does not explicitly show or suggest that error voltage is derived from a sensor" and then states "it would have been obvious to one of ordinary skill in the [art] that an input signal provide [sic] to the input of Soo's loop filter could be generated by a signal." Applicants submit that the obviousness rejection was improperly made under 35 U.S.C. § 102.

Soo discloses a sampled-data loop filter described beginning in column 8 and illustrated in Figures 5 and 7. Soo discloses a sampled-data phase detector 104 and an analog sampled data loop filter 106 at column 4, beginning at line 6. Soo states at column 4, lines 21-24 "[t]he new phase detector 104 and loop filter 106 differ from conventional continuous-time circuits in that the signals in these circuits only take on new values at discrete time intervals." Apparently, the phase detector 104 and loop filter 106 of Soo are configured to respond to frequency error at their inputs such that the phase detector detects when one of the input signals is a harmonic of the other input signal." See column 4, lines 25-31. Soo also discloses a sampled-data integrator/summer 250 that can be thought of as a sampled-data analog filter and can be designed to match the requirements of a phase-locked loop at column 8, lines 33-39. Applicants submit, however, that Soo does not disclose a self-tuning filter, having a first input at which is incident a varying digital clocking signal, a second input at which is incident an input signal corresponding to a sensor, and an output at which is incident a filtered signal

that is consistent with the input signal received a constant number of samples previously, as recited in claim 15. Accordingly, Applicants respectfully submit that claim 15 is patentable over Soo. Furthermore, claims 16-20 are seen to be patentable because they depend from claim 15.

Claim Rejections Under 35 U.S.C. § 103

The Examiner rejected claims 1-6, 9 and 11-14 under 35 U.S.C. §103(a) as being unpatentable over Podolak. Podolak is directed to "detecting the upper bandwidth limit of the analog input signal" primarily to encode and decode audio signals. *See* the last paragraph in column 2. Podolak discloses a bank of frequency detectors, each having a high-pass filter with a different cut-off frequency. *See* the last paragraph in column 5. Podolak utilizes those high-pass filters in what it refers to as a "staircase approximation of the analog input signal" at column 9, line 5.

Podolak further utilizes a low-pass filter to sample the input analog signal at a variable sampling rate determined by the output of the sampling rate selection circuit to develop the staircase approximation of the analog input signal. *See* column 4, lines 19-24. The sampling rate selection circuit passes one of fifteen clock signals to a low-pass filter. *See* Column 7, lines 51-54. Furthermore, in column 10, beginning at line 33, Podolak discloses multiple sampling intervals having different sampling rates, but states that during a sampling interval "the sampling rate is maintained at a constant value." Thus, Podolak selects sampling rates only in steps and maintains a selected sampling rate for period of time during which a plurality of samples are taken.

Accordingly, Podolak maintains a constant filter frequency for a plurality of samples taken at varying rates within a step range and also selects a particular stepped filter frequency for a range of sampling frequencies and so does not maintain filter frequency at a constant ratio of sampling frequency.

11

Applicants submit that Podolak does not disclose data acquisition or a data acquisition unit. Rather Podolak discloses a "system for reproducing analog data" and the apparent goal of Podolak is a "reduction in the amount of digital signals required to reproduce a given analog signal." *See* column 2, lines 51-54. Thus, Applicants submit that Podolak's reproduction of analog data is not analogous with the data acquisition of the subject application.

Accordingly, Applicants respectfully submit that claim 1 is patentable over Podolak. Furthermore, claims 2-10 are seen to be patentable because they depend from claim 1.

Applicants further submit claim 11 and 12 are patentable for at least the same reason asserted in connection with claim 1 and that claims 13 and 14 are patentable because they depend from claim 12.
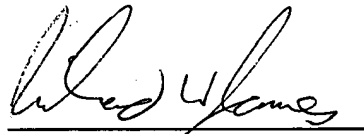
New Claims

Applicants submit that the new claims are patentable at least because Podolak does not disclose data acquisition or a data acquisition unit and because neither Podolak nor Soo disclose a filter having a frequency that is maintained at a ratio of the sampling frequency.

Conclusion

Applicants respectfully submit that claims 1-34 are in condition for allowance. Applicants further submit that no new matter has been introduced in the amendments presented herein. Support for claims 21 and 31 may be found throughout the specification and particularly in the three paragraphs beginning at the top of page 6 of the specification as originally submitted. Support for new claims 30 and 34 may be found throughout the specification and particularly in Figure 1 and the accompanying text, which begins on page 7 of the specification as originally submitted. Support for claim 27 may be found throughout the specification and particularly in the first full paragraph on page 8 of the specification as originally submitted. The remaining claims recite subject matter supported throughout the specification.

Accordingly, reconsideration of the present objections and rejections and passage to allowance of claims 1-34 at an early date are earnestly solicited. If the Examiner is of the opinion that the instant application is in condition for disposition other than allowance, the Examiner is respectfully requested to contact Applicant's Attorney at the telephone number listed below so that any concerns may be expeditiously addressed.

Respectfully Submitted

Richard W. James
Registration No. 43,690
Attorney for Applicants

25 Churchill Road
Pittsburgh, PA 15235
Phone: (412) 243-8708
Facsimile: (412) 243-4070
rich@jamespatent.com